TR Series

2-Phase Stepping Motor Driver

User's Manual

Made by TROY Enterprise Co., Ltd

Environment Responsibility

- TROY is always committed to environment protection. All packaging material is recyclable and reusable.
- If disposing of used product, please recycle by type as per waste disposal procedures.

----------Protect the green earth with your care and commitment----------

＊The product is subject to design modification for performance improvement without prior notice. For more details please contact your local seller.

Precautions

Precautions for using

1.Thank you for purchasing TROY products. Please read this user's manual thoroughly before installing and operating the driver, and always keep the manual where it is readily available.

2. The products described in this manual has been designed and manufactured for use in industrial machinery, and must not be used for any other purpose. We are not responsible for any damage caused through failure to observe this warning.

3.Check that the motor, driver and any accessories are all present. If an accessory is missing or damaged, contact the nearest our branches.

4.Never disassemble the motor and driver. Damage or performance impairment may result. Disassembly voids all warranties.

Precautions for maintenance

Check the ambient environments, clean the system equipment to remove dust and tighten the screws periodically. Also pay attention to the followings.

1. Contact us when repairs become necessary.
2. Since the temperature of the frame of the driver can rise high, be careful when conducting maintenance work or inspection work.

Precautions for warranty period

Within the period of one year after delivery of the system equipment, when failures occurring from design error or fabrication error attributable to the manufacture side occur, we will be repairing the failure free of charge within the reparable range or will replace with substitute. (We cannot hold ourselves responsible for breakage and accidents occurring from your use beyond the specified range described in this document.)

Precautions for disposal

When disposing of the driver and the motor, treat them as ordinary industrial waste.

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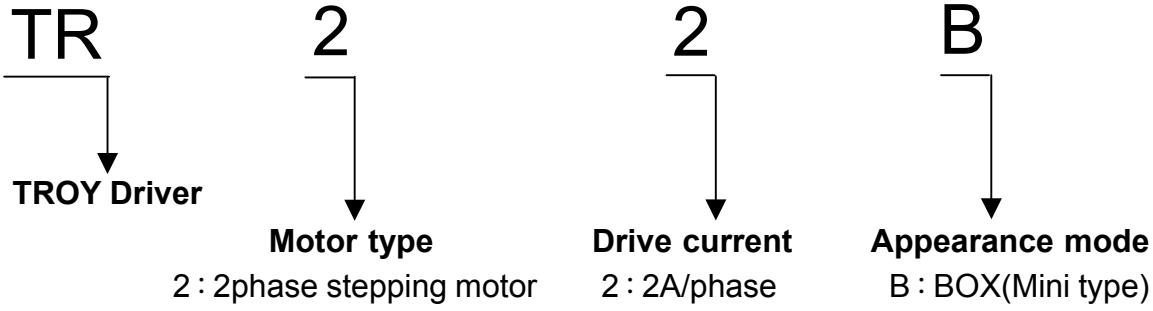
※For any operational or technical question with the product, please `contact us for professional service 「**0800-450-168**」during our business hours.

1.Specifications

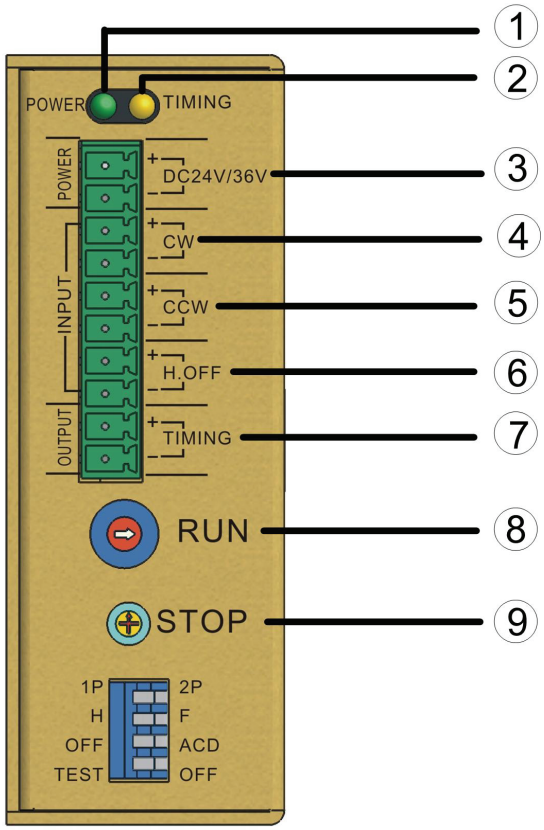
●Specifications

Driver model		TR22B		
Drive current		0.3~0.95A/phase	0.3~1.2A/phase	0.3~2.0A/phase
Input power		DC24V~36V MIN：Above 1.6A	DC24V~36V MIN：Above 1.8A	DC24V~36V MIN：Above 3.0A
Excitation Mode		Full step (1.8° 2 phase excitation), half step (0.9° 1-2 phase excitation) ＜Convertible＞		
Signal input/output		●Photo coupler input interface ●Open collector input interface		
Input signal	CW pulse input	2 pulse：CW input , 1 pulse：Pulse input		
	CCW pulse input	2 pulse：CCW input ,1 pulse：Run direction input		
	H.OFF input	Excitation release input (Holding off)		
Output signal	TIMING Output	Signal is output every time the excitation sequence returns to step 0. Full step：Every 4 pulses output a signal Half step：Every 8 pulses output a signal		
Functions		●Auto current down (ACD)●Self-inspection (TEST) ●Step angle switch (H/F)●Pulse input method switch (1P/2P)		
Protect functions		●Power against contact protection：When the pole of input voltage against connection, the current-cutoff automatically ●Over flow protection：When input current over the rated value, the current-cutoff automatically		
Display		POWER, TIMING		
Dimension		90(L)x65(W)x32(H)mm		
Weight		Net 177g		
Ambient temperature		0℃~40℃		

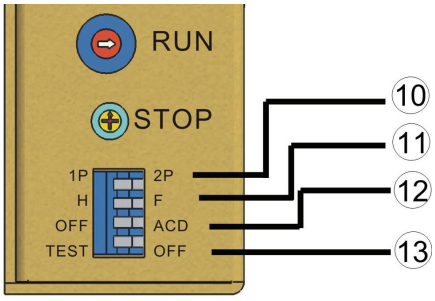
●Product number code



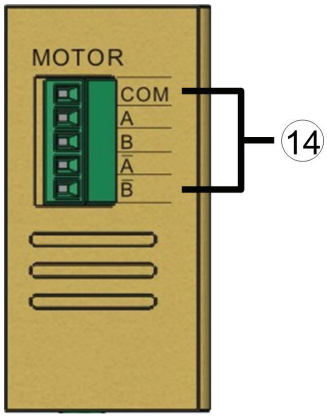
2.Name of driver part



Front panel



Front of panel



Left side of panel

Functions of driver parts

No.	Name of panel	Type	Name of functions	Switch	Functions	Remarks
1	POWER	LED	Power		LED lamp turns on upon input	
2	TIMING	LED	Phase origin indicator		Full step：LED lamp turns on once every 4 pulses Half step：LED lamp turns on once every 8 pulses. LED lamp continuously on during high-speed operation	
3	DC24V/36V	|	Power positive input (+)		Positive voltage (V+) of external power supply to be connected to this terminal.	DC24V~36V
			Power ground input (-)		Negative voltage (V-) of external power supply to be connected to this terminal.	
4	CW	|	2 pulse：CW pulse signal input		Clockwise timing pulse via this terminal	L：0~0.5V H：4~5V Input impedance：220Ω Input current：Below 20mA
			1 pulse：Pulse input		Timing pulse signal input via this terminal	
5	CCW	|	2 pulse：CCW pulse signal input		Counterclockwise timing pulse input via this terminal	
			1 pulse：Run rotation control		Clockwise at "L" level Counterclockwise at "H" level	
6	H.OFF	|	HOLDING OFF		Holding off input to unexcited the motor. Axle easily rotated by hand.	
7	TIMING	O	Excitation phase origin output		Full step：4 pulses output a signal Half step：8 pulses output a signal	Below DC24V Below 10mA
8	RUN	SW	Run current regulation		To regulate the current of running motor	Default：1.32A
9	STOP	VR	Stop current regulation		To regulate the current drop rate upon stopping motor	Default：50%
10	1P/2P	SW	Pulse input method	1 P side	1 pulse input	Default：2P
				2 P side	2 pulse input	
11	H/F	SW	Step angle switch	H side	Half step：0.9°/step, 400 pulses per revolution	Default：F (Full step)
				F side	Full step：1.8° step, 200 pulses per revolution	
12	OFF/ACD	SW	Auto current down	OFF side	Motor current to be maintained at run current upon stopping pulse input	Default：ACD ★ACD recommended to mitigate temp rise of motor/ driver
				ACD side	Motor current drops automatically approx 0.1 sec upon stopping pulse input, so as to mitigate motor temp. Drop rate to be set at VR of STOP	
13	TEST/OFF	SW	Self-inspection (TEST) switch	TEST side	CW running of driver at 2PPS	Default：OFF (Shot down)
				OFF side	Stop self-test. Set OFF side during normal operation	
14	MOTOR	O	Motor wiring		To connect stepping motor with driver	

※：LED→LED lamp, SW→Switch, VR→Adjustable resistor, \| →Input, O→Output

The front view of motor

The axis of motor

CW
(Clockwise)

CCW
(Counterclockwise)

3.Current regulating switch operation

(1) Set Run current of motor

a. Adjust the motor current with「RUN」switch

Adjusting range0.3A/phase~2A/phase

b. The current is defaulted at scale「A」

Rated current 1.32A/phase, almost 65% of rated current

「RUN」switch scale ⟷ Current

Scale	Run current
0	0.30
1	0.30
2	0.36
3	0.47
4	0.59
5	0.70
6	0.82
7	0.94
8	1.07
9	1.19
A	1.32
B	1.45
C	1.59
D	1.73
E	1.87
F	2.00

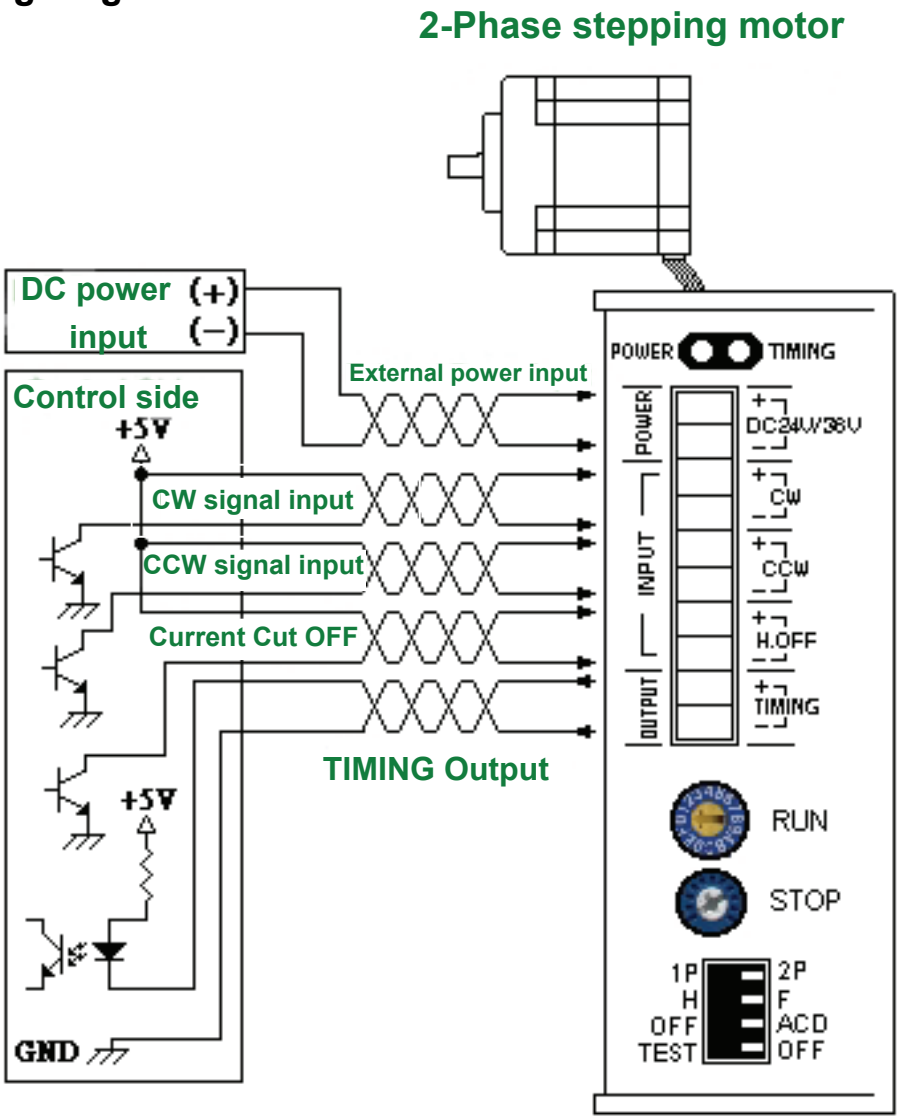
(2) Set Stop current of motor

While current stopping, adjust the scale of「STOP」VR(0~10), it can change the rate of current down while stopping，the rate of current down from 10% to 65%

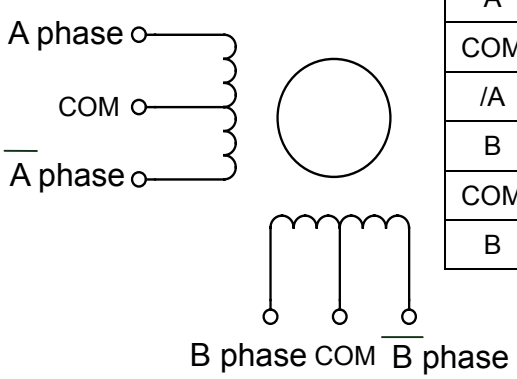
「STOP」VR scale ⟷ Current

Scale	Drop rate of current (%)
1	10
2	10
3	20
4	30
5	40
6	48
7	52
8	58
9	60
10	64
11	65

4.Connecting diagrams



2phase motor internal connecting diagram

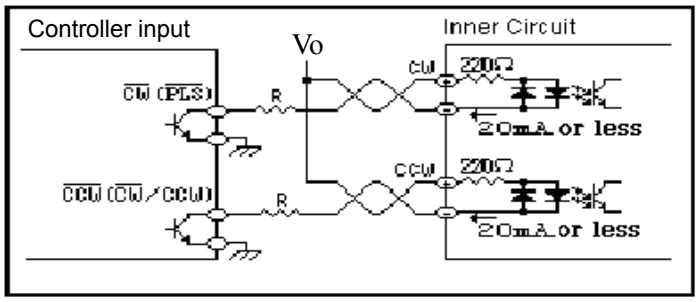


	TROY	SANYO DENKI	TAMAGAWA		ORIENTAL
				TS3103N40	
A	Black	Orange	Black	Red	Black
COM	Yellow	White	Yellow	Black	Yellow
/A	Green	Blue	Green	Red/White	Green
B	Red	Red	Red	Green	Red
COM	White	Black	White	White	White
B	Blue	Yellow	Blue	Green/White	Blue

※The different specifications of SANYO103-8□series has different wiring method, please contact to us「**0800-450-168**」

5.Wiring illustration and application

(1) CW.CCW Pulse input



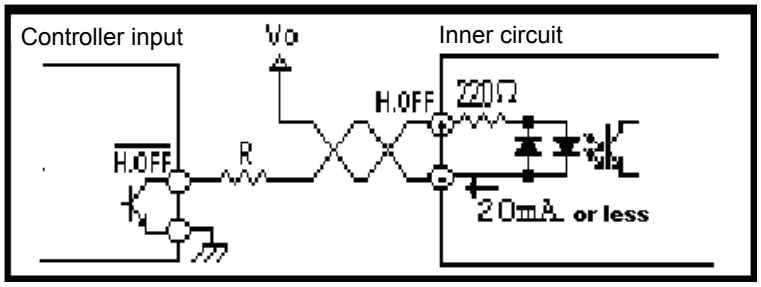
★Note：

External voltage VO	External resistance R
5V	X
12V	390Ω1/4W
24V	1KΩ1/2W
36V	1.8KΩ1W

(a) 2 pulse input mode
The negative edge-triggered input is employed. The motor stays at ''H'' level in the case of no pulse signal input. The motor turns 1 step clockwise in the case of 1 pulse at CW terminal. The motor turns 1 step counterclockwise in the case of 1 pulse input at CCW terminal.

(b) 1 pulse input mode
The negative edge-triggered input is employed. The motor stays at ''H'' level in the case of no pulse signal input. The pulse signal goes to CW terminal, while the running direction signal goes to CW terminal. The motor turns clockwise at ''L'' level and counterclockwise at ''H'' level
(c) Pulse voltage range, ：4~5V for ''H'' level; 0~5V for ''L'' level
(d) Pulse wave width ＞2 μ sec, Up/Down time＜ 2 μ sec

(2) H.OFF input

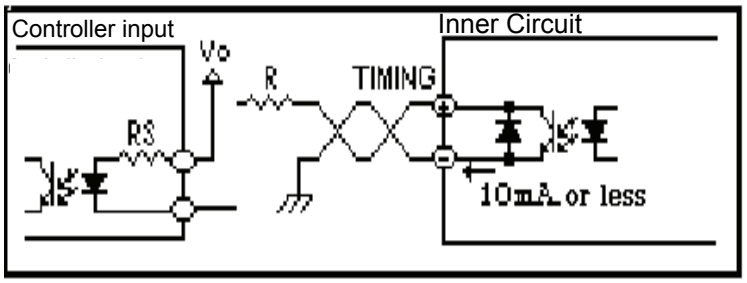


★Note：

External voltage VO	External resistance R
5V	×
12V	390Ω1/4W
24V	1KΩ1/2W
36V	1.8KΩ1W

The motor current turns off when the control signal ''H.OFF'' is set ''L'' level then the motor is HOLD OFF

(3) TIMING output

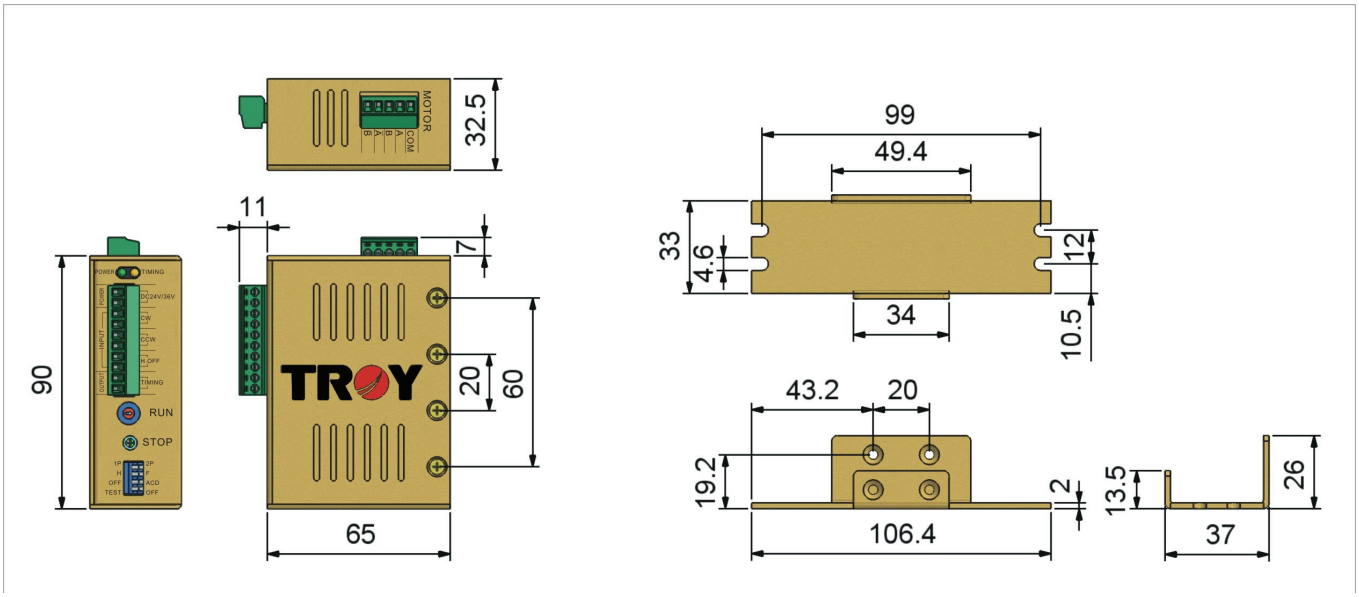


★Note：
Please add proper external resistor(R) to keep the current of circuit below 10mA

$$R = \frac{Vo}{10mA} - RS$$

The excitation timing signal indicates that the excitation state of conforms to the initial detect home position with greater by setting the mechanical home position of equipment to coincide with the excitation home position (Step 0) of motor. The ''TIMING'' lamp on the front panel turns on every 4 pulses at full-step (1.8°/step) and every 8 pulses at half-step (0.9°/step), send out the TIMING signal at the same time. The TIMING lamp is continuously on during high-speed operation, and transistor is on.

6.Diagram and mounting

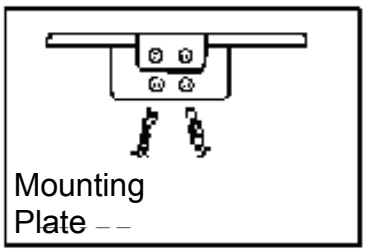


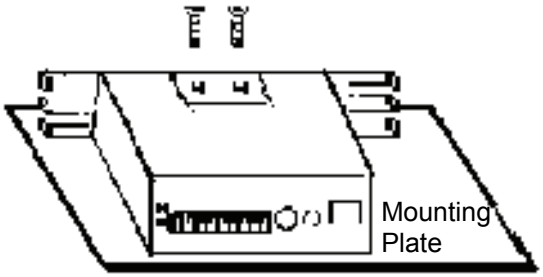
Driver dimension

Mounting seat dimension

●Driver installation mode

1.Horizontal installation





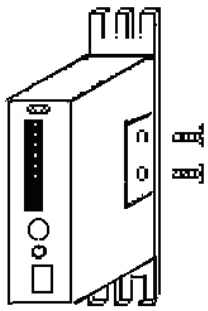
＜Step 1＞

Lock the installation seat onto the mounting plate by using 2 screws

＜Step2＞

Fit the driver into the groove of mounting plate. Mounted with 2 screws

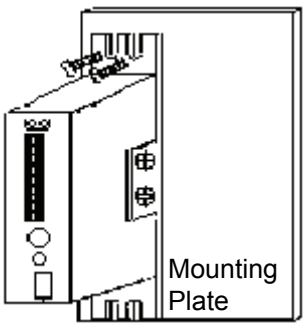
2. Vertical installation



＜Step 1＞

Remove the middle 2 screws of driver. Vertically fit the driver into the groove of the mounting base.

Then re-mount the 2 removed screws



＜Step 2＞

Lock the mounting base onto the mounting plate by using 4 screws

＊For environment protection, paper saving and resources preservation, please download the user's manual directly from SUNHOLY website http://www.sunholy.com.tw

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Our belief ：Commitment to every detail

Our innovation ：Introduction of cutting-edge equipments

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